

THE LEISURE HOUR.

BEHOLD IN THESE WHAT LEISURE HOURS DEMAND,
AMUSEMENT AND TRUE KNOWLEDGE HAND IN HAND.—*Cowper.*



RUTH AS SCHOOLMISTRESS.

HIS ONLY ENEMY.

CHAPTER XV.—NEW TROUBLES.

IT was one of those soft, summer-like days that sometimes occur about the middle of October, when there is only the dropping of the leaves to make us realise that the summer glory of the year is gone. Allen Harford's recovery from the effect of his accident was happily no longer a question of doubt to those who had waited so anxiously for the

doctor's daily report. He was back at The Elms, and sufficiently restored to be able to take possession of his old chair in the library, where he and Maurice usually passed their evenings. It was the first day of what he laughingly called his emancipation, for Dr. Kemp had been slow to allow any relaxation of his rules.

Maurice had been very guarded in answering any question of Allen's connected with the fire, the probable extent of the loss, or salvage of stock, care-

fully avoiding any approach to the subject. How could he bring himself to tell Allen that, owing to his culpable neglect in not paying the fire insurance premiums, the policies had lapsed the day before the fire, and that in consequence the sum of over fifty thousand pounds was lost? His task was made still more painful to him by the fact that his brother trusted him implicitly, and had not the faintest suspicion of anything wrong.

The time, however, had come at length, when there was no longer a possibility of withholding from Allen the real state of their affairs. So Maurice argued to himself this afternoon when he and Allen faced each other across the library table, with a pile of business papers between them. He noticed with concern that his brother still looked worn and pale as he sat writing. A sun-gleam from the opposite window caught his downbent face, and showed Maurice how it had altered since his accident at the fire. "Dear old fellow!" he sighed to himself, "to think I have nothing but bad news to tell him." Then, with a desperate plunge, he addressed himself to his brother.

"Allen, I wish you would throw up your work for a bit, and let us talk. You are doing too much for the first day."

Allen smiled as he looked up. "Why, Maurice, you are almost as great a fidget as Dr. Kemp. It can hardly be called work, certainly not hard work. Have you heard how old Matthew Hine is getting on?"

"Yes; his son John told me this morning that he was better."

"I am glad to hear it. The fire seems to have been a shock to the old man. He watched the building of the factory when he was a boy, and I hear he grieves over its destruction just as though he had been one of its owners."

Allen paused, and waited a moment, as if expecting his brother to say something, then asked, somewhat abruptly, "What do you think of this report about the origin of the fire, Maurice?"

"You mean about its being an incendiary?"

The young man answered slowly, for he fancied there was something doubtful in his brother's manner. To Maurice it seemed of comparatively little consequence what they said about the origin of the fire. Whatever information they might succeed in eliciting, it would not make up the loss or help to rebuild the factory.

"Yes, that is what I mean, Maurice; the insurance company will not pay our claim until that point is settled."

Maurice felt the quickened beating of his heart as he listened, and the short silence which followed was full of torture to him. At last he burst out, "I can keep it no longer; you must know the truth, no matter how it may affect myself."

He saw Allen start, saw the quick, inquiring look in his eyes, and heard, as in a dream, his voice speaking to him, scarcely raised above a whisper, full of repressed anxiety, yet touched as with some deep pity. He did not know that his brother was preparing himself to hear a confession very different to the one he had upon his lips, did not guess that insurance premiums had no place in Allen's thoughts when he said, soothingly, "What is it that you cannot keep? There was a time when you kept no secrets from me; let those old days of confidence come back, Maurice. Tell me everything, without reserve, for both our sakes."

"I don't know how to tell you, Allen, that's the truth," Maurice began, speaking very rapidly, and looking away from his brother, his manner full of pained embarrassment that greatly distressed Allen. "I really don't know how to tell you, I am so ashamed of myself, and feel so strongly that I am nothing but a stumbling-block in your way and a clog upon your prosperity."

"Maurice!" interjected the elder brother, holding up his hand with a gesture of remonstrance.

"Let me say it, Allen, for it is true. I feel now how miserably I have failed in my duty. Always a selfish, good-for-nothing fellow, studying only my own ease and pleasure. Allen, what will you say? what will you think when I tell you that we shall have nothing to compensate us for our loss by this fire?—that—that we were not insured?"

"Not insured!" repeated Allen, with an air of bewilderment and surprise. "I don't understand, Maurice."

"No; how should you, Allen? It is not your way to leave undone till to-morrow what should be done to-day. It is all my fault; there is no excuse for my wretched procrastination. I put off paying the insurance premiums when they were due; then it slipped from my memory altogether."

"Then the policies had expired before the fire took place?"

"Yes," murmured Maurice, who was surprised at the quiet manner in which his brother had received the news.

The information concerning the insurance had brought no additional shadow to Allen's grave face, and there was very little change in his manner, which retained its self-possession, though it still gave the impression of a man who kept his strongest feelings under repression.

Maurice looked at him wonderingly. He had expected that his brother would be much disturbed and agitated by the knowledge of this new loss, and that he would reproach him for his part in it. "Allen, do you realise what I have done? Carelessly thrown away fifty thousand pounds, for neither buildings nor stock was insured at the time the fire took place. Why don't you upbraid me, Allen? I deserve all you can say." As he spoke, the young man's head went down, and he shaded his eyes with his hand, that his brother might not see the pain which his answer would be sure to inflict.

"My dear Maurice!"—there was a slight movement on the part of the listener, who was surprised and agitated by the kindly tones of Allen's voice—"it was not a fault of intention, and the loss affects you as well as me. My boy," Allen continued, with strange wistfulness in his question, "was this the secret that you shrank from telling me?"

He was answered, eagerly, "Yes, it was."

Maurice little guessed the darker thoughts that had been passing through Allen's mind, and made even this confession a relief. What if, in some mad freak of sin, he had been beguiled into some greater crime?

Allen suppressed a sigh. "Poor fellow," he thought; "with this doubt upon my mind about him and the origin of the fire, I could not conscientiously have claimed a shilling of that insurance money."

Maurice had risen from his seat, and now came softly round to his brother, over whom he leaned for an instant. "Let me finish that for you, Allen; you have tried yourself enough for to-day."

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Allen submitted, and lay back restfully in his chair, watching Maurice with the same look of wistful tenderness in his eyes. It seemed to him that since the calamity of the fire, while he lay suffering and helpless, Maurice had been drawn nearer to him, and there had been a strengthening of the old bond of boyish affection. At the same time, he had become conscious of a favourable change in Maurice. He was not so erratic in his movements; the inconsistent inequalities of temper, and the strange watchful look in his eyes, were less marked. It was difficult now to realise the shadow in the background, and believe in the existence of a wretched monomania inciting him to the commission of such an act as the wilful destruction of the factory. Allen closed his eyes for a moment, as if trying to exclude the painful subject from his thoughts.

Maurice was again seated, and, pen in hand, was busy over the completion of his brother's unfinished task. The knowledge that the loss of the insurance money was now known was a relief to him, but his mind was still heavily burdened. It showed in his face as he raised his head and glanced uneasily at his brother, saying, under his breath, "I am glad it is over. Ah! if it had been my only secret, and I had nothing else to fear. Dear old fellow, he little thinks I am at the mercy of such a man as Thomas Rodgers."

CHAPTER XVI.—RUTH HOLLAND'S VISITORS.

RUTH HOLLAND had just dismissed her little scholars, and was putting away slates and copy-books with an air of weariness and dejection. As yet the success of her school was doubtful. About half-a-dozen small specimens of the Deanfield population had been committed to her charge, most of them fractious, unmanageable juveniles, the despair and torment of parents who had spoiled them by ignorant indulgence. With such raw material for her work, the young teacher's progress was, so far, not very encouraging. With all her inward strength of endurance, and faith, and patience, the new life was rather hard to Ruth—grey and wintry, with little sunshine beyond what she herself made for others. There was so much harass, so many small worries of a kind utterly unknown to her at Fernside, that she would have often faltered and broken down if she had leaned exclusively upon herself, and had never learned where to look for that true sustaining help which is a tower of strength for those who seek.

The money which remained to Martin Crosse, after all claims against him had been satisfied, proved considerably less than had been hoped, and miserably inadequate to supply more than a tithe of the invalid's necessities; and at present the gain from Ruth's teaching was so small, that it was scarcely worth considering in the estimate of their resources. One fact was painfully real both to Ruth and her stepfather—their only dependence was Aunt Charity's life annuity. With economy this might have been sufficient to ensure comfortable competence to one person, but to three, with the additional burden of expenses incident to sickness, it was comparative poverty. This was the carefully-guarded secret of the new home at Deanfield—the secret of painfully small economies that grew out of the daily struggle to make the best of narrow means. Aunt Charity's temper was sorely tried in these days; not that adversity made her less kind or generous. She did her

best to lighten the family burden, and was equal to much quiet heroism in the way of self-denial; but the necessity that cramped her benevolent instincts, and the pressure of anxieties about the future—not her own, but Ruth's future—all this was not favourable to the preservation of Aunt Charity's equanimity. It was in one of her gloomier cogitations that the old lady asked herself the question whether it would not have ensured a happier lot for her niece if she had cared enough for Clarence Mosley to accept him for her husband. But this was a settlement of Ruth's future from which Miss Charity revolted, even in thought. So she held by her original conviction, that Ruth had done the best and wisest thing in rejecting the squire's nephew.

"I suppose it must come some day," she mused, with a little wistful sigh; "I can't expect to be here always, and Ruth will want some one to care for her when I'm gone; but who will it be? I don't know any one, either in or out of Deanfield, that I should think quite worthy of her, unless it might be—" She broke off abruptly without naming the individual whom she had selected as a possible subject for favourable consideration. After a pause she added, "I have my suspicions that *he* would be only too glad, but—no, I won't say a word about him. I know he would be Martin's choice, but Martin has made so many mistakes on his own account, that his judgment can hardly be worth much." At this point the door was softly opened, and Ruth came in looking very fair and sweet, in the dark stuff dress that fell about her in soft folds. School was over for the day, and the old man had not yet awoken from his afternoon sleep, so she had come to have a little talk with Aunt Charity. The old lady paused in her work, and pushing up her steel-rimmed spectacles, closely scanned her niece, for it struck her that she was looking very tired and pale.

"Turn your face a little more to the light, Ruth; I want to look at you."

Ruth laughed, but did as she was asked, saying, wonderingly, "To look at me, aunt! Why?"

"No matter why, young girls should not be too inquisitive."

The inspection lasted a few seconds; then Ruth inquired, demurely, with a humorous pucker of her lips, and a sparkle of fun in her eyes, such as Aunt Charity had often seen before the clouding of the bright days at Fernside, "Well, aunt, what is the result? have I inked my face?"

"The result is just what I expected, child. You are getting thinner and older-looking, which you have no business to do at your age; but it's not much wonder when you have to be schoolmistress and sick nurse all in one. I suppose you have been nearly worried to death all day with those tiresome children."

"No, aunt; they have all been exceptionally good."

"Humph! it's just like you to say so, Ruth; you always try to make the best of everything and everybody, however disagreeable they may be. I don't know where you get your patience, child."

There was a pause, during which Ruth watched the progress of the cap-border her aunt was crimping.

"Let me finish it for you, aunt; papa is asleep, and I don't think he will wake just yet."

Miss Charity resisted her niece's offer. "No, Ruth, no; you have quite enough to do; it's a pity

you don't try to get some sleep yourself in the afternoons."

This idea amused Ruth. She laughed, and was about to make some playful remark, when her attention was diverted by the unexpected sound of the street-door knocker.

"A visitor, aunt! I wonder who it can be."

This was said with a slight touch of apprehension, but the faces of both aunt and niece cleared when the door opened and they heard a well-known voice that was instantly recognised as that of Sarah Chiffin. A few minutes later and the friends were chatting familiarly by the fire in the little back-parlour. Sarah, divested of her out-door wraps, and installed in Aunt Charity's rocking-chair, while the eccentric old lady, to the great discomfiture of Ann, kept up a series of active migrations to and from the kitchen, sternly resolute on the subject of her visitor swallowing a cup of hot tea to prevent her taking cold—Sarah laughingly submitted; she was used to being taken possession of by Aunt Charity, who could not help being a little arbitrary with her favourites, of whom Sarah Chiffin was one.

Ruth seemed to enjoy the scene, and looked smilingly on while her friend drank the prescribed cup of tea. "Now that you have satisfied Aunt Charity, tell me what happy chance brought you here this afternoon."

"My brother Will had business in Deanfield, and offered to drive me over if I liked to come. So here I am, Ruth. He put me down at the Market Hall, and I walked on here; he will call and take me up when his business is done."

Ruth now made inquiries concerning every member of the Chiffin household, adding sundry feminine queries as to the progress of an elaborate piece of wool-work, upon which Sarah was likely to be engaged for the greater part of the winter. Then they talked of Ruth's stepfather and his increasing helplessness, and they were in the midst of a discussion respecting the prospects of the school, when Sarah broke in with an apology for her interruption. "Forgive me, Ruth; the thought has just occurred to me, and I want to ask you at once, for I have so much to talk about I might forget, as I did the last time I saw you. What of the mysterious parcels that you told me about? Have you discovered who is the sender?"

"No; we are as much in the dark as ever; they are always addressed to papa, but the handwriting is quite strange to us all. At first we fancied they came from Raeburn Manor, but we found out that we were wrong. Papa thought that perhaps Dr. Kemp had sent them, but the doctor himself gave the negative to that by some chance remark which he made to papa about his diet."

"It does seem very strange, Ruth," Sarah said, musingly. "I think you told me that these good things have come at regular intervals ever since your residence at Deanfield?"

"Yes, until a few weeks ago, when they ceased as suddenly as they commenced, and we had nearly given up all conjecture about them, when, yesterday, Ann took in a hamper larger than any of its predecessors, packed with all kind of creature comforts, and all the delicacies that could be thought of for an invalid. Whoever this kind friend may be," Ruth continued, her face flushing, "it is evidently some one who is acquainted with papa's position, and—and—his necessities."

These words were spoken with some little difficulty and hesitation, which Sarah Chiffin was quick to understand. She detected some furtive tear-drops hiding under the shadow of Ruth's long-lashed eyelids, but she wisely made no demonstration of the discovery, though she was longing to comfort Ruth. Sarah was a discreet and judicious friend. "Dear Ruth," she said, breaking the short silence which had followed, "I have an idea about the identity of that unknown dispenser of benefits."

Ruth looked at her friend, wondering and expectant. Sarah went on. "Did it never occur to you that it might be Mr. Allen Harford?"

"Mr. Allen Harford!" Ruth repeated, in very genuine surprise. "Of all the people I know in Deanfield, I should never have thought of him, Sally."

"Ah! I wonder you did not, Ruth, he is such an old friend, and he has always shown such admiration and respect for your father's talents; and, from all that I have heard of Mr. Harford's character, I think he is just the one who might be expected to do generous things in a quiet, anonymous way."

Ruth's friend spoke with animation, and a kindling glow of colour that gave richer beauty to her dark face.

The young girl glanced at her with surprise.

"Now that you have suggested the idea, Sally, I wonder that I never thought of him. I know he is attached to papa, and has always shown much sorrow and sympathy for him; still, it may not be Mr. Harford who sends them, after all."

"There is another reason why I think it likely to be he," said Sarah, thoughtfully. "The sending of these presents ceased just about the time that we know Mr. Harford to have been lying ill from his accident at the fire, and now they are resumed again as soon as he is better and able to go out."

Ruth had not time to say anything in reply, for at that moment they heard the stopping of carriage-wheels at the door, followed an instant later by a loud knock.

"Another visitor," murmured Ruth. "It is not Dr. Kemp, for he made his call this morning."

"And it can't be Will," added Sarah, glancing at the little clock, "for he will not be ready for at least a couple of hours."

Further conjecture was prevented by a tap at the door, accompanied by a perplexed whisper from Ann, whose round red face appeared in the doorway. "If you please, miss, it's Mr. Harford, and master haven't woke up yet. Where shall I—"

The question was answered before it was asked.

"Show Mr. Harford in here, Ann."

Ruth spoke hurriedly, her pale cheeks seeming to have caught some of her friend's bright colour as she waited the entrance of the visitor, struggling with a new feeling of embarrassment which had grown out of their conversation respecting him. Before the two friends could exchange another word, Allen Harford came in. When the first courtesies of meeting were over, Sarah Chiffin pushed her chair a little farther back into the corner, where she sat content only to listen while Ruth kindly expressed her concern about his illness, and answered his questions about her stepfather.

The short November day was rapidly closing in, but Ann had not yet brought the lamp, so the little parlour was only lighted by the bright fire-gleam that played fitfully about those two quiet figures on

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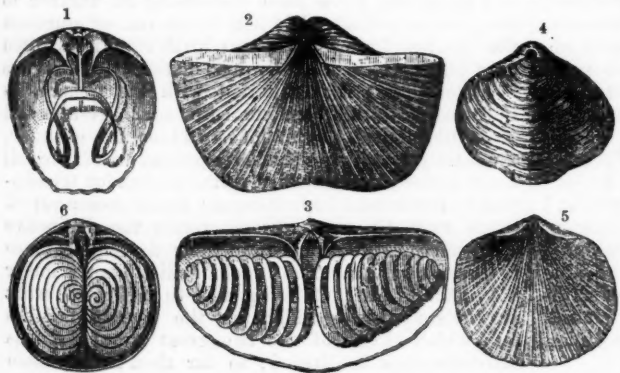
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the hearth and the third quiet figure looking on in the shadow. To her it was limning a picture that would never be forgotten. She had caught the expression in Allen Harford's eyes when they first met Ruth, and the look had come to her like a revelation. "He loves her, and she does not know it." She had whispered this with a keen sense of pain that was a revelation also to herself, for it gave her knowledge of her own heart.

THE DARWINIAN THEORY TESTED BY SCIENCE.

DARWINISM has been subjected, at the instance of its founder, to a crucial test, and has failed. It has had an open trial before the scientific public, and has been condemned. The witnesses chosen on this trial were subpoenaed on the ground of competency and credibility. They were all of one class, it is true, but this circumstance rendered their testimony the more pointed; the value of their testimony is absolutely unique. They were all of the tribe of the Brachiopods, small sea-shells, somewhat like the mussels which adhere to our rocks. They derive their stiff name, like others, from the sounding Greek. It is in fact a nickname, given to denote their possession of processes serving both as arms and feet. They are usually classed with the Molluscoids, and are popularly known as Lamp-shells. They are better represented in ancient than in modern life. The fossil collector is embarrassed by the number and variety of one genus, *Terebratula*; their pretty little forms are amongst the first acquaintances we pick up in the quarries and cliffs. They were called Lamp-shells by the old naturalists from their similarity to the elegant well-known common lamp of the Romans. The hole which in the latter serves for the wick, in the former allows the passage of a short mooring-rope. By this they attach themselves to rocks or to other shells. Some of the fossil species were free swimmers, but the majority were mussel-like. Following the fashion of illustrated papers, we give a portrait of a group of our principal witnesses.



1. *Waldheimia flavesceus*. 2. *Spirifer striatus*. 3. Same, interior of dorsal valve.
4. *Athyris concentrica*. 5, 6. *Atrypa reticularis*, the latter dorsal valve.

There are upwards of 3,000 distinct species of these creatures found in a fossil state, and only about one hundred species amongst the present life of the globe.

There are 126 genera known, of which twenty-two only are recent. The species now living are found in all climates and at all depths of the sea. The fossils have the distinction of the highest antiquity and the most entire persistence throughout all the past life history of the earth. With the exception of Dr. Dawson's *Eozoon Canadense*, the Lingula, a Brachiopod shell, is the earliest form of life at present known; the first envelope of the marvellous divine communication of organic being, whose form and superscription is now readable amongst the contents of nature's waste-basket. They are distinguished structurally by having some kind of internal support attached to the shell. In the genus *Terebratula* this is a projection like the recurved merry-thought bone of a chicken. In the *Spirifer* it is like a spiral carriage-spring. When this is silicified, as in some of the fossils, it forms a delicate and beautiful object, which should be noticed when you look over the fossil cases in a museum. This order of creatures attained its highest development in regard to variety in the old Silurian epoch. The number of species declined almost one-half in entering the carboniferous limestone, increased a little again in the oolitic rocks, and then suddenly dwindled to the present comparatively insignificant exhibition. During all this time there was a constant dying out of old forms and introduction of new. About nine genera begin the roll of life in the lowest formation, the Cambrian; 52 others begin in Silurian days, 21 in the Devonian, 7 in the Carboniferous, 2 in the overlying Permian, 2 in the Triassic, 11 in the Oolites, 5 in the Chalk, 3 in the Tertiary, and 7 in the recent period. It will hence be obvious that if the Brachiopods do not show the formation of species by modification of form in a long course of descent, nothing else can be expected to prove it.

The Brachiopods have been most fortunate in their historian. Mr. Davidson, of Brighton, contemporary and friend of Mr. Darwin, has made them the subjects of his life study. Mr. Davidson is a native of Edinburgh, was born in 1817, studied under distinguished teachers at Edinburgh, in Paris, and London, on the recommendation of Von Buch attached himself to the investigations which have made him famous, and has expended money, time, travel, and indefatigable industry in his chosen pursuit.

This was about the year 1850; from that date to 1871 he published the results in the handsome quarto volumes of the Paleontographical Society, accompanied by copious illustrations. Since the completion of the review in 1871 he has continued his studies with undiminished enthusiasm and added various supplements to its literature. Thus one special line of God's work in creation has been fully and conscientiously worked and made known. Mr. Davidson has published about 3,000 pages of original matter, illustrated by about 300 crowded well-executed plates, all forming actual additions to knowledge. In 1865 he received the Wollaston medal from the Geological Society, in 1868 the silver medal, in 1870 the gold medal of the Royal Society. Titular honours from British and foreign learned bodies have been showered upon him, so

that their enumeration absorbs the bulk of the title-page of his later treatises. We have, therefore, in the qualifications of the Brachiopod family and their

historian, the best possible opportunity for testing the Darwinian hypothesis of the creation of species by descent under modification in time.

But we have also the circumstance that the witnesses and the judge were selected by the author of the system himself. Thus the verdict is also an award.

We now simply resort to Mr. Davidson's account of the matter in a lecture given by him to the Brighton Natural History Society, reproduced by him in the pages of the "Geological Magazine" for April, May, and June in the present year. He says:—

"These remarks lead me to give some extracts from a letter which I received from Darwin as far back as the 26th of April, 1861. In that letter, this eminent and admirable observer writes, 'I do not know whether you have read my "Origin of Species." In that book I have made the remark, which I apprehend will be universally admitted, that, as a whole, the fauna of any formation is intermediate in character between that of the formation above and below. But several really good judges have remarked to me how desirable it would be that this should be exemplified and worked out in some detail, and with some single group of beings. Now every one will admit that no one in the world could do this better than you with Brachiopods. The result might turn out very unfavourable to the views which I hold; if so, so much the better for those who are opposed to me. But I am inclined to suspect that on the whole it would be favourable to the notion of descent with modification. I can hardly doubt that many curious points would occur to anyone thoroughly instructed in the subject, who could consider a group of beings under the point of view of descent with modification. All those forms which have come down from an ancient period very slightly modified ought, I think, to be omitted; and those forms alone considered which have undergone considerable change at each successive epoch. My fear is whether the Brachiopoda have changed enough. The absolute amount of difference of the forms in such groups at the opposite extremes of time ought to be considered, and how far the early forms are intermediate in character between those which appeared much later in time. The antiquity of a group is not really diminished, as some seem to think, because it has transmitted to the present day closely allied forms. Another point is how far the succession of each genus is unbroken from the first time it appeared to its extinction, with due allowance made for formations poor in fossils. I cannot but think that an important essay (far more important than a hundred literary reviews) might be written by one like yourself, and without very great labour.'

"In several subsequently written letters, Darwin reiterates his suggestions. I can assure you that I have not neglected a request coming from so eminent a quarter, but I am bound to state that I have found the subject beset with so many apparently inexplicable difficulties, that year after year has passed away without my being able to trace the descent with modification among the Brachiopoda which the Darwinian doctrine requires."

After having thus stated the origin of the investigation, Mr. Davidson summarises the results in the following important sentences:—

"Notwithstanding the theoretical doctrine that has been promulgated with respect to the origin of species, we are still and shall probably for ever remain in the

dark, or within the region of suppositions, with respect to so important a question.

"Darwin's tempting and beautiful theory of descent with modification bears a charm that appears to be almost irresistible, and I would be the last person to assert that it may not represent the actual mode of specific development. It is a far more exalted conception than the idea of constant independent creations; but we are stopped by a number of questions that seem to plunge the conception in a maze of inexplicable, nay, mysterious difficulties; nor has Darwin, so far as I am aware, said how he supposes the first primordial form to have been introduced. The theory is at best, as far as we can at present perceive, with our imperfect state of knowledge, but half the truth, being well enough in many cases as between species and species; for it is evident that many so-called species may be nothing more than modifications produced by descent. It applies, likewise, to accidental variations as between closely allied genera, yet there is much more than this, with respect to which the theory seems insufficient. The strange geological persistency of certain types, such as *Lingula*, *Discina*, *Nautilus*, etc., seems also to bar the at present thorough acceptance of such a theory of general descent with modification.

"We have no positive evidence of those modifications which the theory involves, for types appear on the whole to be permanent as long as they continue, and when a genus disappears there is no modification, that I can see, of any of the forms that continue beyond, as far as the Brachiopoda appear to be concerned, and why should a number of genera, such as *Lingula*, *Discina*, *Crania*, and *Rhynchonella*, have continued to be represented with the same characters and often with but small modification in shape during the entire sequence of geological strata? Why did they not offer modifications or alter during those incalculable ages? Limiting myself to the Brachiopoda, let us see what further they will tell us upon this question. Taking the present state of our knowledge as a guide, but admitting, at the same time, that any day our conclusions and inductions may require to be modified by fresh discoveries, let us ascertain whether they reveal anything to support Darwinian ideas. We find that the larger number of genera made their first appearance during the Palæozoic periods, and since they have been decreasing in number to the present period. We will leave out of question the species, for they vary so little that it is often very difficult to trace really good distinctive characters between them; it is different with the genera, as they are, or should be, founded on much greater and more permanent distinctions. Thus, for example, the family *Spiriferide* includes genera which are all characterised by a calcified spiral lamina for the support of the brachial appendages; and however varied these may be, they always retain the distinctive characters of the group from their first appearance to their extinction. The Brachiopodist labours under the difficulties of not being able to determine what are the simplest, or which are the highest families into which either of the two great groups of his favourite class is divided; so far then he is unable to point out any evidence favouring progressive development in it. But, confining himself to species, he sees often before him great varietal changes, so much so as to make it difficult for him to define the species; and it leads him to the belief that such groups were not of independent origin, as was uni-

versally thought before Darwin published his great work on the 'Origin of Species.' But in this respect the Brachiopoda reveal nothing more than other groups of the organic kingdoms.

"Now although certain genera, such as *Terebratula*, *Rhynchonella*, *Crania*, and *Discina*, have enjoyed a very considerable geological existence, there are genera, such as *Stringocephalus*, *Uncites*, *Porambonites*, *Koninckina*, and several others, which made their appearance very suddenly and without any warning; after a while they disappeared in a similar abrupt manner, having enjoyed a comparatively short existence. They are all possessed of such marked and distinctive internal characters that we cannot trace between them and associated or synchronous genera any evidence of their being either modifications of one or the other, or of being the result of descent with modification. Therefore, although far from denying the possibility or probability of the correctness of the Darwinian theory, I could not conscientiously affirm that the Brachiopoda, as far as I am at present acquainted with them, would be of much service in proving it. The subject is worthy of the continued and serious attention of every well-informed man of science. The sublime Creator of the Universe has bestowed on him a thinking mind; therefore all that can be discovered is legitimate. Science has this advantage, that it is continually on the advance, and is ever ready to correct its errors when fresh light or new discoveries make such necessary."

This is a courteous but complete "not proven."

If the Darwinists are thus driven away from the animal kingdom, can they hold their own in the domain of the other great province of life on the earth—plants?

Here also we are able to summon a single witness against them whose testimony is so weighty that it is absolutely conclusive. We call one of mature experience, of unquestioned skill, of large knowledge, of public character, holding diplomas from the Royal, the Linnæan, the Geological, and a host of foreign institutions—Dr. Carruthers, the keeper of the botanical department of the British Museum.

We give his testimony from an address to the Geologists' Association, of which he was then the president, at the opening of the session 1876-1877, published in the Proceedings of the Association, January, 1877. Dr. Carruthers says:—

"The evidence for or against this hypothesis must be sought in the records of the past history of the earth, for whatever progress has been made in collecting collateral evidence, no single case of evolution of one species from another has come within the observation of man. The plants portrayed on the ancient paintings and sculptures of Egypt, the fruits placed in coffins with embalmed bodies, and the fruits and seeds found in ancient lake dwellings, all belong to existing species, with which they agree in the most minute and apparently accidental particulars. The existing order of plants, if it be due to genetic evolution, supplies no proofs of it.

"The evidence for evolution must be found in the rocks. However varied the existing forms of plants are, if this hypothesis be true, they must all have been connected together by gradational forms; so that from the highest plant to the simplest *Bacteria* there must be in time a series of gradations by which we can pass from the one end of the series to the other. And these intermediate gradations are the fossil forms of the successive geological epochs pre-

served, more or less completely, in the sedimentary deposits.

"What is the testimony of the rocks? The abundance of animal life implies a corresponding abundance of vegetable life, but the hard parts of marine animals have been preserved, while the Cellular Algæ have left the most imperfect record. The great extent of the primæval vegetation is testified to by the enormous quantity of carbon contained in the most ancient rocks. Dr. Dawson says that 'it is scarcely an exaggeration to maintain that the quantity of carbon in the Laurentian rocks of Canada is equal to that in similar areas of the Carboniferous system.' . . .

"No doubt there is in the older Palæozoic rocks a great absence of any records of land life. But the evolution of the Vascular Cryptogams and the Phanerogams from the green seaweeds through the liverworts and mosses, if it took place, must have been carried on through a long succession of ages, and by an innumerable series of gradually advancing steps; and yet we find not a single trace either of the early water forms or of the later and still more numerous dry-land forms. The conditions that permitted the preservation of the fucoids in the Llandovery rocks at Malvern, and of similar cellular organisms elsewhere, were, at least, fitted to preserve some record of the necessarily rich floras, if they had existed, which, through immense ages, led by minute steps to the Conifer and Monocotyledon of these Palæozoic rocks.

"The complete absence of such forms, and the sudden and contemporaneous appearance of highly organised and widely separated groups, deprive the hypothesis of genetic evolution of any countenance from the plant record of these ancient rocks. The whole evidence is against evolution, and there is none in favour of it.

"The whole evidence supplied by fossil plants is, then, opposed to the hypothesis of genetic evolution, and especially the sudden and simultaneous appearance of the most highly organised plants at particular stages in the past history of the globe, and the entire absence among fossil plants of any forms intermediate between existing classes or families. The facts of palæontological botany are opposed to evolution, but they testify to development, to progression from lower to higher types. The Cellular Algæ preceded the Vascular Cryptogams and the Gymnosperms of the newer Palæozoic rocks, and these were speedily followed by Monocotyledons, and, at a much later period, by Dicotyledons. But the earliest representatives of these various sections of the vegetable kingdom were not generalised forms, but as highly organised as recent forms, and in many cases more highly organised; and the divisions were as clearly bounded in their essential characters, and as decidedly separated from each other, as they are at the present day. Development is not the property of the evolutionist; indeed, the Mosaic narrative—the oldest scheme of creation—which traces all nature to a supernatural Creator, represents the operations of that Creator as having been carried out in a series of developments, from the calling of matter into existence, through the various stages of its preparation for life, and on through various steps in the organic world, until man himself is reached. The real question is,—Does science give us any light as to how this development was accomplished? Is it possible, from the record of organic life preserved in the sedimentary deposits, to discover the method or

agent through the action of which the new forms appeared on the globe? The rocks record the existence of the plants and animal forms; but as yet they have disclosed nothing whatever as to *how* these forms originated."

We therefore hold it to be now firmly established that the Darwinian theory is disproved by the facts, and that it is not a right interpretation of nature.

This fascinating theory is sharing the usual fate of misleading opinions. However brilliant and attractive they may be, yet no sooner is it discovered that they will not do in practice than their first friends forsake them, and they soon fall out of the province of the philosopher into that of the jester. Darwinism is coming to this. As an instance of its discouragement, cloaked in most polite terms, we quote from the annual address of Dr. Duncan, President of the Geological Society. "The mind is," he says, "dissatisfied with the belief that all the wonderful arts in nature, the limited direction of variability, the parallelism of form, ornament and physiology in contemporaneous and successive groups of fossils, sometimes widely separated zoologically, are due to the action of physical changes and heredity alone. It is true that the physical change is not fortuitous, but relates to the inevitable, and thus its influence on life is part of a great philosophy; but is that sum of the action of the mysterious energy on matter which we call life simply passive, and only alterable by external conditions? According to the prevailing theory, if all the external conditions remain the same, the individuals of a species, or the species of a genus, will retain their classificatory characters; but if change takes place in the physical conditions, or if alterations occur in the struggle for existence, then the variability will bear a relation to the intensity of the opposing forces. Extinction or the survival of the fittest results, and this is accompanied by loss of specific identity. Is this all the truth? Is there not some positive energy in living things which, if uncontrolled and uninfluenced by externals, will produce progressive changes?"

This means that, in the judgment of the president, pronounced in solemn conclave, the theory that species originated in descent with modification, is insufficient to account for the facts, and is therefore untrue.

S. R. P.

REMBRANDT.

THE vulgar idea of Rembrandt which very widely obtained among the last generation of Englishmen was that of a Dutch painter who produced black-looking pictures—an idea that could not have originated from the contemplation of his pictures, which, deep-toned as they are, are suggestive rather of dazzling light than of darkness. The popular notion, doubtless, had birth at a time, now happily past, when the picture-markets, as well of London as the Continent, were overflowing with the works of what the dealers and auctioneers jocosely called the "dark masters." These were for the most part Scripture subjects, painted on dark backgrounds, in which the figures seemed to be in a manner embedded. Some forty or fifty years ago, when art was little understood among us, these dreary specimens were imported continuously in cargoes, were eagerly bought up, and found their way into private collec-

tions of more or less pretension. Hundreds of them were by the vendors boldly attributed to Rembrandt, though the improbability is enormous that he ever laid a touch on a single one of them; for there never was a work of his, whether it were painting or etching, that needed to go about in search of a purchaser. His merits were fully recognised, from their very earliest display, by his own countrymen, who paid him handsomely for his works, and valued them too highly, as they had abundant reason for doing, lightly to part with them. Although more than two centuries have passed away since his death, his reputation has increased with the lapse of time, while the products of his pencil and etching-needles have risen from fifty to a hundred-fold in pecuniary value.

Rembrandt Paul Gerretz, otherwise Rembrandt of the Rhine, was born in 1606. His father was a miller, living on the bank of the river near Leyden, and had intended to bring up his son as a scholar; but the boy quarrelled with the Latin grammar, hated conjugations and syntax, and was repeatedly found drawing heads or sketching objects when he should have been studying his accidence. The miller, wisely indulging the boy's bent, took him away from the philological preceptor, and placed him with an artist, one Van Zwaanenburg, with whom he remained three years. On leaving Zwaanenburg, he studied for about as long a period with other masters, but from none of them, it would appear, did he acquire anything more than a familiarity with the mechanical details of the painter's art. In fact, his so-called teachers could teach him nothing else, and perhaps it was fortunate for Rembrandt and the world that they were not men of sufficient mark and influence to leave their impress on his labours. Be that as it may, he had to form his own style, and he formed it by working in his father's mill, where the light descended from a window in the lofty roof above his head, and where he wrought sedulously in copying the peasantry around him and the natural scenery amid which they dwelt. The Flemings were tolerably good judges of painting at that time; the Flemish school had already achieved a reputation, and liberal patrons were not wanting among the merchants and burgomasters, who yielded them substantial encouragement. It was soon seen that the son of the miller at Leyden was doing good work. Some of his friends advised him to offer his pictures for sale, and accordingly the young man set off for the Hague with a canvas he had just finished. Vastly to his surprise, and, as may be conceived, still more to his satisfaction, a dealer there gave him a hundred florins for his performance. In his joy he hired a chaise, and rode home in triumph.

From this time Rembrandt's life seems to have been a series of successes, so far at least as concerned his art. He soon became famous, and taking numbers of pupils, multiplied pictures by their assistance, covering their work, where it was defective, with his own. Early in his career he distinguished himself by his famous etchings, which have rarely been rivalled, and never surpassed. There is a peculiar charm in good etchings, and they are a delight to the connoisseur in nearly all stages of their progress. Rembrandt took advantage of this, and sold impressions from his plates in nearly all stages of their execution, and by this means realised considerable sums; though it was not until after his death that they rose to the abnormal value at which they are

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still estimated. Even at the commencement of the present century, before the existing rage for collecting had set in, several of Rembrandt's masterpieces in this style of engraving were sold at prices varying from thirty to a hundred guineas a copy, prices they would probably never have obtained had not Boydell, who had got possession of the plates, destroyed them for the purpose of enhancing the value of the impressions.

The possession of wealth failed to make a gentleman of the famous painter. He grew fond of low companionships, hating with all his heart the ceremonials of politeness; he did not, however, squander

tions are vigour and spontaneity; they resemble the work of no other master, but in all instances are stamped with his own individuality. He painted and he etched all varieties of subject during his long career, and got through a vast amount of work. His portraits, however, are his finest pictures, and of these the men are immeasurably superior to the women; of female beauty, indeed, he seems to have had but a feeble idea, seldom attaining to anything more than an agreeable comeliness, as we see it in some of his peasant women. The wonderful effect of his portraits, which often seem to stand out of the frame, while the backgrounds recede as much as the figures



REMBRANDT (BY HIMSELF).

[From the Portrait in the Louvre.

his money, but hoarded it carefully, with a sort of miserly instinct. He repelled all overtures for familiarity with persons above the class in which he had been born and nurtured, and would not make their acquaintance, with the exception, however, of one patron, a man of wealth and influence. This was the burgomaster Six, a discriminating connoisseur, and a bit of a *bon vivant*. Six fitted up in his own house at Amsterdam a painting-room for his distinguished protégé, and entertained him hospitably. It was here that Rembrandt made the famous etching known among collectors as the "Landscape de Moutarde." The painter was fond of mustard with his meat, and there happening to be none on the dinner-table, a loutish-looking servant was sent out to buy some. Rembrandt, noting the fellow's deliberation, offered a wager that he would begin and finish an etching before he came back. The bet was accepted; the artist set to work and actually finished the plate before the man returned—an impression from which plate would now be worth from forty to fifty guineas.

The chief characteristics of Rembrandt's produc-

project, must be attributed to a profound knowledge of light and shade, combined with certain secrets of colour not known to others. The light upon his pictures is like that of a passing sun-gleam, now soft and golden, now vivid and sparkling, the dazzling appearance of which is perhaps as much due to the depth and transparency of the shadows as to any other cause. In drawing Rembrandt is often deficient, and this is most apparent in his most ambitious attempts. A greater defect, because it is one that is more widely recognised, is his almost total want of refinement and delicacy, not to say modesty, in his conception and treatment of important subjects. Some of his female faces are actually frightful objects to look at: witness, for instance, the head of Potiphar's wife in the picture exhibited at Buckingham House last winter. When he first began his artistic career, Rembrandt bestowed extraordinary pains upon his work, finishing every part with careful minuteness. An example of this high finish is the well-known picture of "The Woman taken in Adultery," which for some fifty years past has been hanging in our own National Gallery. It seems to be

too often the case, that when a painter becomes popular and there is a general demand for his pictures, he sinks the artist in the manufacturer, and turns off his productions in quick time, in order to realise their value in coin. In this case he generally retrogrades in skill, as scores of our own rising painters have done, and sometimes deservedly falls into disesteem and neglect, only recovering his ground, if indeed he recovers it at all, by a return to careful and conscientious labour. Rembrandt was not an exception to the rule, but his powerful genius could assert itself under any circumstances; and when he abandoned his careful and deliberate style for the sake of vigour, freedom, and effect, he seems to have done it once for all. None of his maturer works, so far as we have been able to judge, exhibit in any remarkable degree the evidence of care or caution, much less of hesitation, in their execution, but rather run riot, as it were, with a recklessness of handling.

If we were called upon to name the one artist who has characterised his productions with the unmistakable stamp of originality more than any other man in Europe since the days of Michael Angelo and Raphael, we should be obliged to name Rembrandt of the Rhine. He is not merely, as we have hinted above, the pupil imitator of no particular master and the disciple of no particular school, but he stands entirely aloof from all his predecessors and contemporaries, and almost equally so, though he has had, and has to this day, numerous imitators, from all succeeding professors of the painter's art. If this pronounced originality was partly due to the mediocre merit of his instructors, who failed to inspire him with the desire of following in their steps, it must be owing still more to the native vigour and spontaneity of his mind and will. There are many painters in England at the present day who delight and instruct the people by their works, but there is not a single one of them all who stands forth so prominently distinct and separate from the rest by sheer force of style and treatment as Rembrandt does among the painters of the Continent.

In contemplating the works of this singular artist, the apparent evidence of carelessness, and even of whim and frolic, shown in the queer up-and-down strokes of the pencil, often leads persons to imagine that nothing can be easier to do than to paint in that way; indeed, people ignorant of art will often say as much. To the student, however, all this apparent carelessness, proof as it is of wondrous mastery and facility of hand, is proof also of profound knowledge and of the practical experience which has made such knowledge expressible in a manner so grotesque. *Ars est celare artem*—in other words, a thorough artist will mask his art. We are rarely more deceived than when we imagine that because a thing seems to have been easily done it was so done—the fact being usually that the evidence of rapid facility in execution is rather a proof of deliberate and careful study in preparation. Perhaps no man ever deceived the simple, inartistic observer so thoroughly as Rembrandt has done; the splashy, scratchy, angular, criss-cross vagaries of his brush speak of anything but carefulness, while the lumps of solid pigment dragged, as it were, over the light of the picture will at times look as though they had dropped there by accident, and should have been removed. The experienced connoisseur, while delighted by this playful artifice, is not at all deceived by it; he can see

the mastery that underlies it all—the marvellous skill with which all the delicate gradations of tint and tone and shadow are disguised in the wild and wanton manipulation of material. Rembrandt died in 1674, leaving one son, his pupil, who, however, failed to distinguish himself.

The English people have fair opportunities of judging of the work of Rembrandt, seeing that numbers of his finest performances are hung in the mansions of our nobility and upper classes, most of which are freely open to the public at stated seasons, and some of them all the year round. There are, further, several Rembrandts in the National Gallery, where the visitor may study the peculiarities of the rare Flemish painter at leisure. The picture already mentioned, "The Woman taken in Adultery," is perhaps the best known to visitors, and is well worthy of attentive consideration, though it is by no means a typical example of the master's works. To ourselves the nearly full-length portrait known as Rembrandt's Jew has always been most attractive—it is so perfectly human in expression, so wonderfully man-like in feature and in pose; while the figure, without being thrown forward, sits, as it were, in clear space, so perfectly transparent is the shadowy background. The finest assemblage of Rembrandts it was ever our good fortune to see together in this country were those which once hung on the walls of the Rembrandt Room, a bedchamber in the mansion of the late Duke of Buckingham, at Stowe. We saw them all brought to the hammer some thirty years ago. Among them was the portrait of a negro boy, which, if we recollect rightly, realised about two thousand pounds, and that *chef d'œuvre* of the master, "The Unfaithful Servant," sometimes called "The Unjust Steward," a picture of very few figures, but which speaks home to every spectator, and certainly tells its tale with a kind of savage eloquence. This grand picture has fortunately passed into the possession of Mr. Wallace, and it formed a part of the capital collection which he so considerably lent to the Bethnal Green Museum, and where it hung for a couple of years, affording pleasure and profit to thousands.

Good engravings from Rembrandt's pictures are now but rarely to be met with, and seem of late years to have disappeared even from the splendid print-shops of the West End. As for the matchless etchings, of which he left so many, those who possess them guard them like jewels for their private delectation. There is a fine selection of them, however, in the British Museum, though these are not too easily accessible to the public. Would it be deemed irreverent in us were we to suggest that they might all be photographed, and the perfect *fac similes* thus produced be sold at a low price, to the immense advantage of the art-loving section of the community, and without any loss, but, on the contrary, a certain gain, to the authorities at the Museum?

THE "CHANSON DE ROLAND."

WE are told that when the destinies of the last Anglo-Saxon king were settled on the field of battle at Hastings, a Norman knight, called Taillefer, riding in front of the serried troops of William, encouraged his companions in arms by singing the high deeds of Charlemagne, Roland, and the brave

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champions who fell at Roncevaux in the cause of Christianity. During the whole of the mediæval period the name of Roland was surrounded by a kind of halo commending it to the admiration and respect of all stout-hearted soldiers; his reputation extended far beyond the frontiers of France, to Italy, Germany, England, nay, even Denmark; and the blast of the magic horn which summoned from the farther side of the Pyrenees the emperor's forces to the rescue of a handful of heroes sounded like the war-note of the defenders of the faith. Very little is known, indeed, about Roland himself; he was the nephew of Charlemagne, and held the important post of lord warden (as we should say) of the marches of Brittany. When we have made this statement, the amount of information supplied by Eginshard and other contemporary annalists is exhausted, and we are left to wonder how, around half-a-dozen lines of the monkish chroniclers, a poem gradually clustered which, under the name of "La Chanson de Roland," is certainly one of the finest, as well as the earliest, of French epics.

During the course of the ninth and tenth centuries the story of Roncevaux was widely circulated throughout France; wandering *jongleurs* went from castle to castle, from town to town, singing how the King Marsile concluded with the traitor Ganelon that infamous bargain which the patriotism of the middle ages compared to the agreement made by Judas with the Pharisees of old. They then related the terrible requital exacted by Charlemagne, who cut the Saracens to pieces, and condemned Ganelon to an ignominious death. The various circumstances in Roland's history thus formed the theme of as many rhapsodies, exactly as had been the case with Homer's poems; and these *cantilènes*, subsequently put together, developed into real epics, the best known of which is the one we are now considering. Let us, in the first place, give a brief *résumé* of the story.

Charlemagne had conquered nearly the whole of Spain, and was besieging the town of Cordres (Cordova). Thereupon Marsilius, King of Saragossa, calls an assembly of his barons, and asks them to advise him on the best course he should pursue, in order not to be crushed by the Emperor of France. The Saracen chieftain Blancardin recommends him to send an embassy to Charles, promising both submission and conversion to the Christian faith, together with the payment of a large sum of money, and the delivery of hostages as a guarantee of his sincerity. In the meanwhile the Moslems must temporise, and see what can be done. Blancardin's opinion was adopted, and, at the head of a numerous company, he went to ask Charlemagne on what conditions peace would be granted to Marsilius. The emperor immediately called his councillors together, and Ganelon, opposing Roland's advice, led the meeting to decide that the offers of the Saracen prince should not be rejected, and that an ambassador should be sent for the purpose of stating what were the wishes of the French monarch. Naime, Duke of Bavaria, Oliver, Turpin, Archbishop of Mentz, Roland himself, undertook to deliver the message; but Charlemagne declined the offers of them all, for he knew that the journey was full of danger, and he did not wish to imperil the life of any of his peers. Roland then pointed out Ganelon as the best man to conduct the expedition, and the whole assembly sanctioned his choice. Ganelon, however, remembered that the two brothers, Basilius

and Basilius, formerly sent upon exactly the same errand, were beheaded by the orders of the Emir Marsilius; he therefore concluded that the aim of Roland was to bring about his death, and he firmly resolved to be avenged, if he should return safe and sound, which he scarcely expected, to the Christian camp. Blancardin and Ganelon soon started on their way to Saragossa, the latter bearing the written credentials of the emperor, and complaining so bitterly of Roland's bitter plot against him, that his Moslem fellow-traveller had no difficulty in persuading him to betray the cause of the French. Nevertheless, Ganelon, when in the presence of Marsilius, delivered his message with such haughtiness that the indignant chieftain wanted to pierce him through with his javelin. Fortunately, Blancardin appeased his master, and informed him of the Frenchman's real intentions. Marsilius then had an interview with the traitor in his own garden, and finally Ganelon promised to deceive Charlemagne as to the designs of the Saracens, and so secure the appointment of Roland as leader of the rear-guard. A first army sent against the French would probably be defeated, but a second one was sure to prevail.

Laden with presents by Marsilius, Ganelon returned to the camp; he told the emperor that his embassy had met with the greatest success; the leader of the Saracens pledged himself to receive at Aix the sacrament of baptism in the course of the following year; meanwhile, he sent the stipulated tribute. The Christian army, overjoyed at the happy results of the expedition, prepared to return home; and on the morrow Charlemagne, whom ominous dreams had visited during the night, held a council for the purpose of selecting a leader to whom the dangerous post should be assigned of commanding the rear-guard. Ganelon, contrary to the wish of the emperor, secured the appointment of Roland. Proud at being entrusted with so important a task, the warden of the marches declared that twenty thousand men alone would suffice to protect the retreat of the army; the twelve peers joined the emperor's nephew. The French now started, and soon Charlemagne and the main body arrived in Gascony.

In the meanwhile the Saracens had gradually drawn close to the rear-guard. Oliver perceived their formidable ranks from the top of a mound, where he had taken up his position. Astonished at their numbers, he asked Roland to sound his ivory horn; Charlemagne would hear the blast and return to their assistance. Carried away by a mistaken sense of honour, the prefect of the marches refused to comply with his friend's request. The battle immediately began, and, after several vicissitudes, it ended by the death of the twelve peers, of Archbishop Turpin, and of Roland. A few minutes before expiring, Roland had sounded his horn, and the emperor, on hearing the well-known blast, hastened back again from the other side of the Pyrenees. He came too late, however, and the only thing to be done was to load with irons Ganelon, whose treachery had been suspected from the very first.

The slaughter of twenty thousand French warriors had not taken place without great loss on the side of the Moslems. Two immense hosts of infidels and part of the third were destroyed, and Marsilius, one of whose arms had been cut off by Roland, returned to Saragossa. When the Christians arrived at Roncevaux, they could see still in the distance the clouds of dust raised by the last Saracens hurrying back to

Spain. Charles started in pursuit, anxious to avenge his companions. Unfortunately the dusk was coming on, the sun was setting, and the emperor's thirst for vengeance seemed doomed to be disappointed. Nevertheless, in answer to his fervent prayers, an angel came down from heaven and promised him that a miracle would be vouchsafed by the Almighty to the patriotism of the Christians. The sun accordingly set only after a complete slaughter of the pagans on the banks of the Ebro. The French encamped on the battle-field, and, reaching Roncevaux the next day, they gave the honours of burial to all the Christian soldiers except Turpin, Oliver, and Roland, whose bodies were preserved for the purpose of being embalmed.

At the beginning of the war Marsilius had sent to Baligandus, Emir of Babylon, requesting the assistance of a powerful force in order to defend the common interests of all the believers in the Prophet of Islam. After considerable delay, Baligandus, with an immense army, arrived just at the moment when Marsilius, mortally wounded, had fainted away from grief in his palace at Saragossa. He bade the disconsolate commander cheer up, and pledged himself to inflict upon the French a severe lesson. Charlemagne's soldiers were still at Roncevaux, mourning over the tragic end of Roland, Oliver, and the remainder of the twelve peers, when a challenge was sent from Baligandus to the emperor. Without any further loss of time, the Christians drew themselves up in battle array, and Charlemagne, who had singled out the Saracen Emir of Babylon, slew him at last with the help of an angel. On hearing of this overwhelming catastrophe, Marsilius turned his face to the wall and expired. Charlemagne captured Saragossa, killed most of the infidels, caused the rest to be summarily baptized, and returned to France, taking along with him the heathen queen Bramimunda, whose conversion followed as a matter of course.

Such is a short abstract of the "Chanson de Roland," one of the most remarkable specimens of French mediæval literature, and holding the first rank in the rude epics which, under the name of *chansons de geste*, were intended to celebrate the high deeds (*res gesta*) of the knights and warriors of the olden times. It would be absurd to compare the poem we are alluding to here with the "Iliad," Milton's "Paradise Lost," and Dante's gigantic work; but still it strikes us as realising the principal characteristics of the *epopoia*; it was essentially a national poem, for the subject which it relates was nothing else but the struggle between France, or rather Christianity, embodied in the person of Charlemagne, and the Mohammedan invasion; all the actors introduced are as true to nature as the heroes of Homer, and even the language in which the romance is written, despite its roughness, is extremely expressive.

The "Chanson de Roland" claims to be an historical work, and, to a certain degree, it deserves that appellation. A considerable allowance, however, must be made for the imagination of the poet, and we need scarcely say that many of the characters, localities, and other details, cannot be identified. On the other hand, the light it throws upon the whole economy of the feudal system, its forms of judicial procedure, the relations between lord and vassal, etc., is most valuable; and for the history of the language its importance is paramount.

As in the case of the Homeric poems, episodes grouped themselves successively around the main part of the work until the entire composition assumed the shape of the "Iliad" as we now have it, so the "Chanson de Roland" is only one item in a vast cycle which includes romances of very unequal merit, and which was designed to form a kind of poetical biography of the good Emperor Charlemagne. Arthur, the hero of the romances of the round table, stands forth to embody the leading features of Celtic civilisation; in like manner the son of Pepin is the personification of Teutonic society, of the element which has contributed so much to mould the French nation. Need we wonder if we find the old *trouvères* ascribing to their darling monarch exploits which he never performed, and actions which were little short of miracles? The conquest of Lombardy, of Apulia and Calabria, of Aquitaine, of Bulgaria, of Saxony, of Flanders, and of England, are celebrated in glowing terms by the authors, known and unknown, of many a long-winded poem. One of them describes Charlemagne's journey to Constantinople, from whence, at the head of an immense host, he starts for the East, conquers Syria, takes Jerusalem, and thus anticipates the Crusades.

The halo with which poetry has surrounded the name of the mighty emperor did not vanish away even at his death. Death! No; Charlemagne is still alive. In the Untersberg he may yet be seen sitting at a marble table with the same majesty and awful grandeur which distinguished him in the palmy days when he held his court at Aix-la-Chapelle. He sleeps, and often he shakes his head, as though under the weight of some painful dream; his long white beard keeps growing; it surrounds already twice the table on which he is leaning; a few centuries more, it will have accomplished the third circle; then, rising from his slumbers, Charlemagne will sally forth and hang his shield on a withered pear-tree, in the midst of the plain of Wals. Hark how, at this long-expected signal, the mailed hosts assemble for the fight, gathered together from the four quarters of the horizon. The trees shoot out fresh leaves, as if the spring had come once more, and, indeed, it is the last spring which this world shall see. The battle begins—the most appalling ever witnessed, for the wicked are here arrayed against the good; light and darkness contend for the final mastery. After a prolonged struggle evil is defeated, and Charlemagne, the Emperor of Germany, rules over the regenerate world.

With this poetical vision we shall take leave of a subject which, as our readers cannot fail to perceive, is full of real interest, because it illustrates an important chapter in the history of literature.

GUSTAVE MASSON.

SEA VERSUS LAND ON THE EAST COAST OF YORKSHIRE.

NO one who lives in the East Riding of Yorkshire, and is in the habit of visiting the coast from time to time, but must have noticed the serious ravages which the sea has been making year after year on the land in that part of the country. Those who live by the seaside have the fact forced on their notice by the havoc they see committed on each side of them, and those who visit such places at more lengthened

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intervals cannot but be even more struck by it. It is difficult to realise the extent of the loss to the area of the island which must have accrued in the course of centuries. Possibly it may in some degree be balanced by alluvial deposits on other sides of the country, or upheavals of the land, or recessions of the sea, such as that which one can scarcely but imagine to have taken place in the west, as, for instance, in the neighbourhood of Bridgewater; but this is a question I need not here consider. I have only to ask consideration for the fact more thoroughly within my own knowledge, of the constant, never-ceasing loss of land by its being washed into the sea on the east coast of Yorkshire. I mean from Spurn Point to Flamborough Head, for beyond that, and from Filey to Scarborough, the case is somewhat different; though there, too, the same process has, though in a less marked manner, been going on; and even the "stupendous cliffs of Speeton," as Waterton has well called them, can but frown on the damage which they themselves have sustained and are still sustaining.

As the matter is one of national importance, to supplement my own observations I wrote to the principal proprietors of land on this coast—Marmaduke Jerard Grimston, Esq., of Grimston Garth; Sir Henry Somerville Boynton, Bart., of Burton Agnes; Henry Strickland Constable, Esq., of Wassand; Charles William Strickland, Esq. (now Sir Charles), of Hildenley; Colonel Haworth-Booth, of Hull Bank House; William F. Bethell, Esq., of Rise Park; and also to the Rev. E. Gordon, rector of Atwick; the Rev. Yarborough G. Lloyd-Graeme, of Sewerby House; the Rev. Thomas W. Kelly, vicar of Mapleton; and the late Professor Phillips, of Oxford; and having, in reply, being obligingly given all the information they were able to afford me, I have to acknowledge their kindness in so doing, and desire here to thank them for it.

It appears that on the average there has been a loss of land of from two to three yards every year, probably about two and a half to two and three-quarter yards per annum; but, as Mr. Grimston remarked in one of his letters to me, "The old maps are so very inaccurately drawn that it is impossible to be correct within twenty yards; in addition to which fences have been taken away and other alterations made which render accurate measurement almost impossible."

There are, however, some actual data to go on, and it is literally a case of *Ex uno disce omnes*. Thus, in the year 1786, Atwick Village Cross was distant from the sea-cliff, in a direct line, so I have been informed by the Rev. E. Gordon, rector of the parish, 44-81 chains, and in 1795 43 chains 40 links, a loss of thirty-one yards in nine years, as stated in a remark on the first parchment page of the parish register; but in June, 1871, 38 chains. In the year 1786, April 30, Mapleton Church, as the Rev. T. W. Kelly, vicar of the parish, has informed me, was distant from the sea-cliff, in a direct line, 28-76. On March 27, 1788, 28-37, so that the sea gained eight and a half yards in about two years, and at this same rate would be up to the church in 146 years. In 1827, October 1, it was 25-45, showing a loss of land of seventy-two yards in thirty-nine years. In 1835, September 23, 25-17. In 1847, August 20, 22-61. In 1849, September 19, 22-15. In 1858, April 17, 21-62. In 1871, June 7, 20-75.

The above calculations from the first recorded date to the present year show an average annual

loss of rather less than two yards, but this appears from measurements taken to be at least one-fifth less than the general average of the coast.

Thus Mr. Kelly has informed me that in the year 1871 the waste of land in that parish was something very unusual, and Mr. Grimston wrote me word that he has been told that as much as sixteen yards were washed away at Kilnsea in one year.

If, then, we take the coastline in round numbers at forty-five to fifty miles, and the waste of land at three, or say two and a-half, yards in each year, this would give a total annual loss of over forty acres between Spurn Point and Flamborough Head alone, or in a hundred years of four thousand acres, which at a value per acre of only £30 or £50, gives a serious money loss of grain or other crops to the country. Or taking the loss, as has been calculated, at one mile since the date of the Conquest, 1066, the money value in the interval, at £30 per acre, would be equal to £1,000,000, or at £50 an acre of more than £1,500,000, and twice this amount since York was held by the Romans.

The principal cause is the gradual giving-way of the cliffs themselves, acted on by rains and frosts, and at the same time the action of the sea at their feet. The lower part being undermined, that which is above it must needs come down sooner or later, and masses detached above destroy the stability of other parts around them. And so the work of destruction goes on, month after month and year after year, faster or slower in some years than in others, according to the nature of the season in winter, but more or less in all seasons and at all times.

There is also another cause—to some extent, at all events—and that is the removal of the shingle from the sea-shore, the natural protection against the inroads of the sea. This may seem a small matter, but that there is reason and ground for the supposition is proved by the law which was passed to prevent the practice so long ago as the reign of King George III.

Within the last few years several Board of Trade prosecutions have taken place for "taking shingle." The result has been that divers persons have been severely fined, and prosecution threatened for repetition of the offence.

In consequence of these proceedings, notices and warnings are given, such as the following, which was published in the Bridlington paper in 1870, on behalf of the owner of the fore-shore, the Rev. Yarburgh G. Lloyd-Graeme:—

"SEWERBY BEACH.

Notice is hereby given, that the removal of sand, shingle, or any other material from within ten yards of the foot of the cliff, is strictly prohibited.

Any person or persons found removing the same, or being concerned in the removal thereof, will be treated as trespassers, and prosecuted according to law.

By order of the lord of the manor of Sewerby,
Marton Lodge, October, 1870." JOHN SMITH.

As to a remedy, there is one, I think, but that almost an impossible one, from the extent of the coast to be protected, except as to small portions here and there, on account of the expense. Nevertheless, there can be no doubt that the whole of the land saved would in time far more than cover the cost. But it is beyond the means of individual proprietors, unless, perhaps, under some special Inclosure Acts, and could only be done by the nation, and the cost would no doubt be considered too great. Convict

labour, or that of the unemployed poor, might, perhaps, meet the difficulty; but there would be no means of lodging them, with the staff that would be required for their management and order on such a thinly-inhabited and wide extent of coast. Or else there is no doubt whatever that a sea-wall of roughly-hewn, or even unhewn, stones, laid at an angle of about thirty-five degrees, would for ever prevent a single inch of encroachment by the sea. This is a matter of fact, of which a ready example is at hand.

At Filey I remember seeing, several years ago, a sea-wall, built on the old plan, like any common wall; but, though strong in itself, it had no chance against the waves of the sea, which "rage horribly" on our north-eastern coast, and so it stood, or partly stood, "rent and beggared," a wreck on land. A little to the south of it was a low wall of the kind I have spoken of, which stood in striking contrast to it. It was built, I think I was told at the time, by a Mr. Unett, the proprietor of the adjoining cliff. The heaviest waves washed harmless against it and up it. "Hitherto shalt thou go, and no further," was the eternal decree of the safe charter the foundations of the wall were built upon, and even the accumulated force of the German Ocean does it and can do it no harm. "Labitur et labetur, in omne volubilis ævum" up and down the slope, and while

"The sturdy rock, for all his strength,
By raging seas is rent in twain,"

their whole power is wasted and exhausted on the low wall which is safe in its humility, and "stoops to conquer" the wasted force of the most mighty waves.

But as to the unchecked ravages of the sea in former times, as it is an "ill wind that blows no one any good," so we find it on record that the misfortunes of those who suffered by them gave opportunity for the exercise of charity on the part of those who lived in security farther inland. Thus, in the parish register of Kirkby Wharfe, in the West Riding, the following items occur in the churchwardens' accounts for 1697, as sent to me by my friend and neighbour, the Rev. Richard Wilton, now rector of Londesborough, but formerly of that parish:—

"To a man y^t lost his corn & goods by seabreak, 6d.

"To two men that lost by seabreak, 1s. 0d."

Again, in 1711,—

"Gave to some who had lost their estates (as they said) by seabreak, 6d."

On some of the old maps we read, "Here stood Auburn, washed away," "Hartburn, washed away," "Hyde, washed away," as also have been Frismark, Thorlesthorpe, Redmayre, Pennysmark, Upsal, Pottersfleet, Outhorne (where one tombstone was standing in the churchyard in the year 1828, but a few years later it was gone), Kilsea (where half of the church fell in 1826, and ten years later the village was removed), and Ravenspurn too, its name possibly derived from the Raven, the Danish standard, or we may suppose that its cliff may have been a home and shelter for the land birds of that ilk, which there and therefore gave it its name, as Flamborough remains yet for the sea-birds, happily now protected by the "Sea Birds Act."

I have heard it stated on good authority that the remains of its stone walls and buildings are still visible under the sea three miles beyond Spurn Point. I also remember hearing it said that the ruins of Auburn are yet to be seen where it once stood, opposite to the still standing Auburn House, farther inland. I alluded to the fact as follows, in my account of the wheatear, in my "History of British Birds," having several times been at the spot myself:—"Others are to be seen along the low cliffs between Bridlington Quay and the solitary house of Auburn, the only relic of the village of that name; not, I suppose, Goldsmith's 'lovelier village of the plain,' for the encroaching ocean has long since washed away the very foundations of it. Even the relics, it is said, are still to be seen below the water when the latter is sufficiently clear. In one sense, indeed, his description suits it as a 'Deserted Village,' for the signs of life are banished from it for ever, and if its consecrated churchyard still receives the dead, it is those who perish by shipwreck on the retired coast, but who will one day come forth, when 'the sea shall give up her dead.'" The same thought has since been elegantly and well expressed by my neighbour, Mr. Wilton, whom I have before referred to, as recorded by him in the following lines:—

Here Auburn stood,
By pleasant fields surrounded,
Where now for centuries the ocean flood
With melancholy murmur has resounded.

Here Auburn stood,
Where now the sea-bird hovers,
Here stretched the shady lane and sheltering wood,
The twilight haunt of long-forgotten lovers.

The village spire
Here raised its "silent finger,"
Sweet bells were heard and voice of rustic choir,
Where now the pensive chimes of ocean linger.

Dear white-faced homes
Stood round in happy cluster,
Warm and secure, where the rude breaker foams,
And winter winds with angry billows bluster.

Here, in still graves,
Reposed the dead of ages,
Until invaded by the rush of waves,
As through the green churchyard the tempest rages.

Here Auburn stood,
Till washed away by ocean,
Whose waters smile to-day in careless mood
O'er its lost site, and dance with merry motion.

Thus, too, Professor Phillips tells us how, seven-teen or eighteen hundred years ago, a Roman villa of great proportions stood on what is supposed to be the *δολιμενος κολπος* (of Ptolemy), or Filey Bay, their "Felix Portus," a "statio bene fida carinis," so that the sea must have made serious inroads since then. Within the last twenty years, as Professor Phillips has written me word, "sea waste exposed the traces of a building on the very edge of the cliff, paved rudely, with corner-stones morticed in the middle for upright posts; a central stone; the floor covered one foot, or one foot and a half deep, with innumerable bones of animals used for food, pottery by loads, all, or nearly all, kinds known as Roman,

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* From "Nisbet and

from Samian to the earliest coins, many till late imperial, and abundance of other things indicative of a large residence, consumption of much food, tenanted by many persons and their servants, possibly part of a Prætorium; but this 'tugurii congestum culmen' was all that remained; the sea had swallowed up the grander building." The well-known Filey Brigg (or bridge) speaks for itself as to its having been the base of the rest of a former cliff whose remains still abut on its inner end, and are a standing evidence of what is no longer to be seen but with the eye of the mind; and if, as I have always thought, every straight and precipitous cliff is but a section of some ancient slope which originally slanted downwards to a level at a greater or less distance (another, perhaps, which rose and sloped down in like manner beyond it having previously, in the lapse of ages, fallen away), it is easy to think what the total waste must have been, and as easy to foresee what must in like manner take place with what is still left, if not timely prevented.

It seems to me a much more pressing question than that which has been raised in the country and in Parliament as to how long our coal-measure may be calculated to last, for, beyond all doubt, as things go on at present, the ground we now stand on in the East Riding of Yorkshire—and the like is the case in other parts of the island—will be washed away from under our feet,—“the land we live in” will be no longer in existence. “Fuit Ilium et ingens gloria” will be the future motto of what was once the site of Old England.

Nunburnholme Rectory.

F. O. MORRIS.

The Fight of the Future.*

SUNS of the past, whose settings now are done,
Shine out on us with all your treasured warmth
And ancient grandeur, as when ye arose
On Eden and its joys, or lighted up
The peaks of Ararat, or shone upon
Shinar and Ur and Haran, all along
The pilgrim-life of the believing man,
Who went where the great Voice commanded him,
Where the celestial glory guided him,—
He knew not whither; or as when ye shone
On Zion with its marble palaces;
Or on Moriah's temple blazing full,
In the rich glow of Oriental gold,
Hour after hour around its glowing walls
And smoking altar; or as when you saw
The Roman firebrand kindle its last flames,
The Roman battle-axe came thundering down
Upon its cedar-work, till all was ruin,—
Gate, wall, and rampart flung into the depths
Of the dark hollow that engirds her round,—
The smoking ruin bubbling up with blood.

Suns of the past, that lighted up old Troy,
And wreathed fair Ida with your joyous glow;
And gleamed on Salamis, or bronzed the Nile;
And struck the lyre of Memnon, or stole thro'
The pillars of Palmyra, and blazed o'er
Or watched the rising of the Pyramids,
The giant gates and avenues of Thebes,
Or chisellings of Assyrian palaces

And the great idols of the Nimrod fanes;
And saw Phœnician Carthage rise and fall,
And Rome ascend her ancient seven-hilled throne;
That shone upon old Britain's sullen wastes,
And Caledonian forests, ere they knew
A history, and stored up within their mines
The dormant fire, that like a prisoned spirit
Was to awake in later days, and make
This isle the wonder of an envious world.
Suns of the city and the silent waste!
Suns of the sea-swept cliff and dew-bright plain,
That gleam along the river, light the glen,
Or gild the ocean, o'er whose ancient face
For ages ye have shone in calm or storm!
Suns of earth's sapphire roof, beneath whose bend
Time's deeds have all been done, Time's words all spoken,
Time's mighty changes wrought!—I turn to you,
And ask you to reveal the hoarded secrets,
Evil and good, that ye have witnessed here.

Ye cannot tell the future, nor can see
Into its boundless distances, tho' high
Your station be above the hills of earth
And clouds of time. Yet, as I look on you,
I muse on what you one day shall behold
Hereafter, when the ages shall unroll
The long, long hidden good in store for man,
And bid creation doff its withered leaves
To clothe itself with spring,—resplendent spring,
The spring of heavenly verdure, holy peace,
All purity, all beauty, and all love.

Then heaven has come to earth, and earth is heaven;
The shadow of the tomb has passed away,
And all is life; each mortal mist is gone,
And earth is fair once more; death's dethroned,
Its sceptre shivered, and itself a name
Among the fallen potentates of old,
That moulder in dishonoured sepulchres,
That have been, and yet are not, nor again
Shall ever be. The breaker-up of love,
The sunderer of families, the fierce,
Remorseless foe of man exists no more:
The spoiler now is spoiled, the prison-house
Is emptied, and the prisoners go forth
With song and joy; the long captivity
Is now avenged; the broken heart is healed,
The tears are wiped, the age of light begun.

Sun of the coming age, how long shall these
Deep clouds of evil that pollute our sky
Delay thy dawn and muffle all thy beams?
Rise in thy strength, and bid the night be gone;
Go forth in haste, O pure and perfect Light,
Do battle with the darkness of the world,
And overcome; rear trophies everywhere;
Dissolve the dazzling error; glorify
The truth, and send it forth enrobed in power,
To do its work among the sons of men.
The frost of unbelief now covers earth,
Whitens its fields and binds its joyous streams,
Sparkling, yet, in that very sparkling, cold.
Shine out, and with thy universal warmth
Melt down this frozen darkness, dissipate
Each vapour that would dim the eye, O Sun!
Bid the false vanish, and the true appear.

All that is true in worship must have root
In truth, eternal truth, and not in dreams.
All that is real in service, or in that
Which men religion call, must be the offspring
Of truth, and not of error or of doubt.
For he who deals with God must know the God
To whom he cometh, and must know the way

* From "My Old Letters," by Horatius Bonar, D.D. (London: James Nisbet and Co., Berners Street.)

By which the Holy is to be approached
By the unholy, or for prayer or praise.

True Light, whose place of dawn shall be the East,
The ancient East, old birthplace of the true,
Array Thyself in majesty, and come!
Out from fair Salem's rock-hewn sepulchre
Thou comest in the greatness of Thy strength
And brightness of Thy beauty, scattering gloom
And pouring out Thy gifts of peace. Not like
That which so fatally once issued from
The fabled casket of the all-gifted one,
Filled with all human woes, to be let loose
Upon a hapless race; but, like the sweetness
Of the rare spikenard-box of old, once broken
To anoint the Holy One, which filled the room
With odour, such as told of heaven itself;—
So from the opened sepulchre come forth,
Fair Sun, and with the fragrance hidden there,
Immortal, irresistible, divine,
Breathe o'er this sickly soil, and sweeten all
Our atmosphere with everlasting health.

Varieties.

WEDDING RING.—A curious incident lately occurred at a marriage at St. Mary's parish church, Dover. A French couple from Calais, having been staying in the town a sufficient length of time to have the banns published in that church, came up in the morning to be married, and the ceremony proceeded satisfactorily until the joining of hands and the putting on of the ring, when it was discovered that the Frenchman had no ring. There was an awkward pause. No one in the company could lend a ring for the occasion; whereupon the officiating clergyman sent the verger for the church-door key, the eye of which instrument was said to have been used in other places in similar emergencies. It was found, however, that the eye was not sufficiently large to admit the bride's finger. The bridegroom searched his pockets again, and brought out a bunch of keys attached to a ring. This ring, with its appendages, was placed on the book, from thence it was transferred to the bride's finger, and with the steel ring of the bunch of keys the ceremony was duly completed.

RADIOMETER.—Most of our readers, at least those who live in great towns, are familiar with the curious and elegant scientific toy (we may call it), the Radiometer. It is like a four-vaned miniature windmill, the vane revolving under the action of light inside a glass tube from which the air has been exhausted. It was invented by Mr. Crookes, F.R.S. In a paper read by Professor Gladstone, F.R.S., at the West London Scientific Institute, he gave a popular history of the invention. In some experiments, Mr. Crookes experienced the difficulty of accurately weighing a hot body, owing to the disturbing currents of air which the heat sets up. He accordingly proceeded to weigh certain substances *in vacuo*. The resulting phenomena puzzled him. An object suspended in a glass vessel near a heated body is drawn towards that body, whilst a cold body repels it. Mr. Crookes proceeded to make his vacuum more perfect by a Sprengel pump. The opposite effect was then seen, the suspended object being driven away instead of attracted—even a lump of heavy metal. The repulsion was found to depend largely upon the nature of the surface exposed to the source of heat. The Geissler Radiometer has mica vanes, and one side of each vane is blackened. A candle brought near them has a pushing effect upon both surfaces, but a greater effect upon that which is blackened. Screened from the light, the vanes begin to move in the opposite direction. In fact, the Radiometer thus placed becomes the hot body. The question might be asked, what rays of the spectrum effect the motion of the vanes? Is light or heat the motive power? But how shall we distinguish between light and heat? Light is simply a visual effect of the molecular agitation we call heat. Rays from all parts of the spectrum take part in the action upon the Radiometer. But there are two

views as to the mode in which the rays set the vane in motion. Mr. Crookes inclines to the idea that the ray simply gives a push to the vanes. But most physicists hold that there is a reaction between the vanes and the glass envelope, and the motion of the vanes is due to residual gas. Mr. Stoney gives us a beautiful explanation, which is now occupying the close attention of our physicists. On the molecular theory of gases he believes that so long as the disc or surface of the vane is warmer than the vacuum in front of it, the molecules are thrown off the blackened surfaces with increased speed. There is thus a procession of quick-moving particles leaving the blackened surface of the vanes, and giving them as it were a kick as they rebound. We can all see that the rays, on reaching the blackened discs, become absorbed. What becomes of them? Surely they warm up the surface of the disc: they become rays of low refrangibility. In the extremely attenuated condition of the air, rapid movements of the molecules are set up, and the blackened discs the more easily give way to the force that sends them backwards.

COSSACK ROGUE.—One of the war correspondents gives an account of the tricks of the semi-heathen Cossack troopers. Passing through the streets of Galatz, the thin, weary-looking horse of a Cossack fell suddenly and lay apparently lifeless on the ground. Its master was moved even to tears, and bewailed the unhappy fate which had not only deprived him of a favourite, but left him horseless just at the most interesting moment of the war. A crowd gathered round, and in it were men whose kind hearts would not suffer them to leave the poor man without some practical expression of their pity. A subscription was made, and the man, taking the saddle from the lifeless animal, went on his way with dried tears, for he had actually wept. As the crowd were bending over the little horse in pure sympathy, a whistle was heard at the other end of the street. The horse sprang to his feet, and with a joyful neigh joined his master, whose clever trick was much admired, even by those who suffered by it. To deceive the good people of Galatz in any transaction in which money is involved is no easy task, and demands an amount of cleverness seldom to be found. Another proof of the same doubtful morality was told by an eye-witness. A Cossack having cast his eyes on a piece of cheese which he desired to buy from a Jew, asked to examine it. While it was in his hands he asked the price, which was, of course, exorbitant. He placed it under his arm and began to bargain. As he talked his comrades passed behind him and each cut off a piece. The Cossack said it was a small cheese, the Jew that it was a big one. But as the Cossack could show it from time to time looking smaller and smaller, the Jew, afraid to attempt any violence, gave in to the Cossack's price, which, unlike that of the Sibylline books, grew ever smaller and smaller, as the article he had to buy diminished.

SCHIPKA PASS IN THE BALKANS.—Schipka, in the Bulgarian tongue, means the wild rose, and the village of eight hundred houses situated at the foot of the pass bears the same designation. It is well named, for all the inhabitants of the fairy-like valley now ravaged by war are engaged in the cultivation and sale of roses. "The little town of Kasanlyk," writes Count von Moltke, in one of his letters from the East, "is hidden behind a forest of gigantic walnut-trees. Its minarets do not rise above the mountains of foliage and branches under which it is buried. How abundant is the water in this part of the country can scarcely be conceived. As in Lombardy, every field and garden is watered by streams conveyed in ditches and trenches." Kasanlyk is the Cashmere of Europe—the Gulistan, "the Gardens of Gule," of the Turks. The rose is not there, as with us, cultivated in pots or gardens, but in fields and on the banks, like potatoes. Nothing is more pleasant to the sight than a field of rose bushes. Millions of red leaves are spread out over the bright green of the rose-fields, and, nevertheless, just then, perhaps, only a quarter of the buds are opening out. Kasanlyk is the place where is manufactured the greatest quantity of the Turkish attar of roses—a perfume which it is difficult to get pure even in Constantinople. Twenty thousand roses, it is calculated, will yield on an average about one hundred and seventy-six grams weight of the precious attar, but in India it is, as in Turkey, commonly adulterated with sandal-wood oil, or diluted with sweet salad oils. Another adulteration is spermaceti and ginger oil. After all the attar is skimmed off a few drops of the essence will still remain mixed up with the water. This perfumed liquid constitutes the well-known rose-water. This year we fear there will be no rose harvest in Gulistan. The fields will be red, but not with their pleasant flower crop and the farmers of Schipka will have more terrible work to do.

—The Echo.

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